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NOTE ON A CASE OF CICATRICIAL STENOSIS OF THE PYLORUS FOLLOWING A PEPTIC ULCER.

By William Sydney Thayer, M. D., *Resident Physician to the Johns Hopkins Hospital.*

Mary G., unmarried, 22 years of age, a colored domestic, was admitted to the Johns Hopkins Hospital on July 29, 1892, complaining of a "knot in the stomach" and "vomiting spells."

Her family history was good; there was no history of tuberculosis or carcinoma in any branch of the family.

She had had measles and whooping cough, and thought that she had pneumonia eight years before entrance. The year after this she had malarial fever. With these exceptions she had always been strong and well. The catamenia began when she was 11 years old and had always been regular and painless. The illness of which the patient then complained began, she said, about three and a half months before entrance to the hospital, with loss of appetite and emaciation. About two weeks later she noticed a small lump in the epigastrium, and at about the same time she began to suffer from frequent attacks of vomiting. These attacks were not associated with much nausea, and the vomitus was often greenish and contained much fluid; no blood. The vomiting resulted, she thought, from the taking of food. There was no abdominal tenderness, though she said there had been some. The appetite from the beginning was very poor. The bowels were constipated and there were frequent frontal headaches. There was marked emaciation. She was somewhat short of breath, and there had been some œdema of the feet three weeks before entrance.

The note on July 30th was as follows:

S. P. In bed, on back; lips and mucous membranes pale; tongue shows a slight white coat. Pulse 82, regular in force and rhythm, tension not increased. Thorax long, costal angle rather narrow; resonance and respiration clear throughout.

Heart.—The point of maximum impulse is palpable in 4th interspace a little inside of the mammary line. Relative dullness begins at the third rib and does not pass the left sternal border. The sounds are clear, rather soft, and accompanied everywhere, when the patient is in the recumbent posture, by a soft systolic souffle, which almost disappears at the apex when the patient is in the erect posture. The second sounds at the base are of relatively normal intensity. The *hepatic* flatness begins at the 6th rib in the mammary line and does not quite reach the costal margin. The border of liver is not palpable. The *splenic* flatness reaches from the 9th to the 11th rib, does not pass the costal articular line; border not palpable.

Abdomen.—Symmetrical; not distended. In the right epigastric region just below the right costal margin opposite the cartilage of the 8th rib is a small nodule, apparently about the size of a horse-chestnut. It descends slightly with inspiration and gives one the impression that it is situated at the pylorus. *Its firmness seems to vary.* On inflating the stomach with bicarbonate of soda and tartaric acid the area of gastric tympany is found to be markedly increased, extending from the 5th rib above to three fingers' breadth below the umbilicus. Owing to the tenseness of the abdominal muscles the position of the small nodule above mentioned could not be accurately determined. It does not appear to be in its former position. There is no enlargement of the lymphatic glands.

The *urine* was negative.

On the second of August a test breakfast was given (a glass of water and 30 grams of bread) and an hour later 300 ccm. of a cloudy fluid was removed by the stomach tube. This contained fragments of undigested bread and curds of milk which had been taken on the previous day. It had a strong rancid smell suggesting butyric acid. The reaction was acid. Tests with congo red paper and tropæolin o. o. were negative. Günzburg's test for free hydrochloric acid negative. Uffelmann's test for lactic acid gave a sharply positive result.

Nourishment was ordered to be given at short intervals in as concentrated a form as possible; stomach to be washed out daily.

℞ Infusion of condurango 20 cc. t. i. d. before meals.

On the 5th of August the condurango was omitted and tincture of nux vomica (0.5 to be increased to 1.3) t. i. d. before meals was ordered.

The patient did not improve under treatment, and notwithstanding the fact that nutrient enemata were given in addition to her other diet she lost 9½ pounds between the 8th and 15th of August. The tumor remained of the same size and showed the same characteristics.

On August 22d an examination of the blood by Dr. Billings showed red corpuscles 4,630,000, colorless corpuscles 12,500, hæmoglobin (mean of two estimations) 69 per cent.

On August 23d another test breakfast was given with a result similar to that following the former; that is, there was no free hydrochloric acid, and lactic acid was present. The patient had been steadily losing ground, the vomiting had continued, and the emaciation had progressed rapidly, the patient having lost 11 pounds since entrance.

An exploratory operation was advised and the patient was transferred to the surgical side; Dr. Finney on duty. At the operation the condition was found to be a cicatricial stenosis of the pylorus following a gastric ulcer, the nodule measuring about four to five cm. in diameter.

Gastro-enterostomy was successfully performed by Dr. Finney, but the patient died 14 days later of an acute dysentery. She had at that time been taking food by the mouth for a week.

The autopsy showed a markedly thickened and indurated pylorus. Just at the pylorus there was an irregular ulcer about 6x2.5 cm. in size, with several small ulcers near by. The induration was partly due to fibrous thickening extending from the base of the ulcer, and in part to a great muscular hypertrophy, the muscular coat at the pylorus measuring 12 cm. in depth, the hypertrophy extending far back into the stomach wall.

This case is of interest from several points of view. The clinical symptoms, if we pass by the youth of the patient, simulated remarkably those of a carcinomatous stricture of the pylorus. The absence of previous dyspepsia, together with the rather sharp onset of the symptoms, a point to which Ewald calls attention, which has certainly been borne out in the writer's experience, the rapid emaciation, the vomiting, the localized tumor, and the absence of free hydrochloric acid, with the presence of organic acids in the gastric juice, make rather a striking picture. The anæmia was perhaps not of that degree which one might have expected in cancer, but grave anæmia is not a constant symptom in this affection. In two cases of cancer of the pylorus in which the writer has had occasion to examine the blood, a distinct increase in the number of red blood corpuscles above the normal, with a large percentage of hæmoglobin, was noted in each case within a week of the patient's death:

Case P., 28–10–91, red corpuscles, 6,605,000; colorless corpuscles, 16,000; hæmoglobin, 103 per cent.

Case A., 25–12–91, red corpuscles, 6,472,000; colorless corpuscles, 30,000; hæmoglobin, 87.5 per cent. In both of these instances there was stricture of the pylorus, with obstinate vomiting and great emaciation, and it may be an actual concentration of the blood as a whole.

The presence of a gastric ulcer in this case seemed during life scarcely probable, owing to the absence of pain and the absence of free hydrochloric acid in the gastric juice. In a muscular hypertrophy one might also have expected to find at least some evidences of free hydrochloric acid in the gastric juice.

A point of considerable interest is the rapid diminution in the secretory power of the stomach, in a condition where we usually expect to find a normal or increased secretion of hydrochloric acid. It is unfortunate that more thorough estimations of the gastric juice (estimations of the pepsin and curdling ferment and of the hydrochloric acid in combination) were not made. The undigested condition of the food in the test breakfast and in the vomitus tends, however, to show that the diminution in the secretory power of the stomach was really considerable. It is also interesting to note how clearly a pylorus of this size may be palpable. It is not impossible, however, that the pylorus is really palpable in many instances when it is in a normal condition. In several instances of late in individuals with thin abdominal walls and enteroptosis or dilated stomachs, a small movable nodule has been felt in the pyloric region in the epigastrium which showed the characteristic rhythmic contraction and relaxation so often to be noted in pyloric tumors. In most instances the pylorus is behind the liver, but when one considers its firmness and distinctness as we see it post-mortem it is but reasonable to expect that should it by any reason descend below its usual position it might in many instances be a palpable organ.

ON THE ORIGIN OF THE THYROID GLAND.

BY W. K. BROOKS, PH. D., *Professor of Zoology, Johns Hopkins University.*

(*Read before the Johns Hopkins Hospital Medical Society, January* 16, 1893.)

All the vertebrates have a peculiar organ known as the thyroid gland, and while it holds no prominent place in our general conception of a vertebrate, this gland is actually one of their most constant and characteristic organs.

In all the jawed-vertebrates, from the sharks up to man, its typical structure is adhered to so closely as to prove that the gland, as it exists in man, is an organ of vast antiquity. In all these animals it is a ductless gland, situated far back in the throat behind the hyoid skeleton, but at an early stage in its ontogeny it is a part of the endodermal epithelium of the pharynx, and it arises on the middle line just within the mouth.

Its function in the jawed-vertebrates is problematical, but these two features in its ontogeny seem to show that, far back in the remote past, before it had assumed its characteristic form, it had another function which stood in some direct relation to the mouth.

The tunicate endostyle is a conspicuous organ which attracts the eye of all observers, but its true structure was first demonstrated by Fol, who proved that it is a pharyngeal gland with excretory cells to produce slime, and with ciliated cells to drive the slime out through the long, narrow, slit-like duct into the pharnyx. Fol also showed its true relation to the ciliated peripharyngeal bands and dorsal lamella, and proved by simple but conclusive experiments that these organs are co-ordinated parts of a single system which has for its function the capture of the microscopic floating food which enters the mouth with the water.

W. Müller was the first to point out the homology of the tunicate endostyle with the vertebrate thyroid gland (Entwickelung der Schilddrüse, Jena. Zeitsch. VI, 1871, and Ueber die Hypobranchialrinne der Tunicata und deren Vorhandensein bei Amphioxus und der Cyclostomen, Jena. Zeitsch. VII, 1872), and this homology has been established beyond the possibility of doubt by Schneider's discovery that the thyroid body of ammocœtes is a slime gland with an opening into the pharynx near the mouth, and that, on each side of this opening, a ciliated furrow or peripharyngeal band runs upwards on the inner wall of the pharynx, just in front of the first gill-slit, to its dorsal middle line, where the two unite to form an epipharyngeal band or dorsal lamella which runs backwards to the œsophagus. Even more conclusive proof of this homology is afforded by Dohrn's account (Studien, etc., VIII) of the histological structure of the pharyngeal gland of ammocœtes, for his studies show, on the one hand, a most complete fundamental identity with the very peculiar and characteristic histological structure of the tunicate endostyle, and they also, on the other hand, prove its identity with the vertebrate thyroid gland, by showing that as development progresses it is cut up by ingrowths of connective tissue into the isolated follicles which are so characteristic of the thyroid gland. Still further confirmation is furnished by Dohrn's discovery in the torpedo embryo (Studien, VIII, p. 60) of two endodermal grooves which run from the ventral margin of the spiracles to the ventral middle line of the pharynx to end at the median, unpaired, thyroid invagination in such a way as to prove that they are rudimentary peripharyngeal grooves.

This most remarkable homology can no longer be questioned. The simplest explanation, and the one which first presents itself, is the one which Müller advances, that the common ancestor of the tunicate and of the other chordata possessed this system of organs in the form in which we now find them in the tunicates, and that while all the jawed-vertebrates have inherited the ventral pharyngeal gland, it has been turned to some new use, as yet undiscovered by the physiologists, and has lost its primitive connection with the pharynx and its functional relation to the mouth, and has become a ductless aggregation of follicles far back in the throat.

In the hope that the sequel will justify the assumption I shall, as my starting-point in the study of the origin of these organs, picture a simple, minute, unsegmented chordata animal, leading a free locomotive pelagic life, and subsisting upon the micro-organisms of the ocean. I shall also assume that this ancestor had an elongated, unsegmented body, stiffened by an axial, unpaired, unsegmented notochord, like that of amphioxus, appendicularia and the ascidian larvæ; that it had a simple, elongated, dorsal, nervous system, and an elongated, ventral, digestive tube, without pharyngeal clefts; that this tube was nearly straight, that it had a capacious lumen, and that, as in amphioxus and the tunicates, this lumen was permanently distended and ciliated, and that the water, with the micro-organisms which float in it, was swept through it by endodermal cilia and not by muscular contractions.

In order to entangle the floating particles of food, and to hold them while the water swept on through the intestine and out of the anus, gland cells for the excretion of slime were scattered among the ordinary ciliated, endoderm cells of the digestive tract. In origin these slime cells may perhaps have been modified or specialized, digestive gland cells.

As particles which are entangled and held captive near the oral end of the gut are more perfectly exposed to its digestive action than those which continue to float with the stream, the most anterior slime cells are most efficient and valuable, and as each variation in this direction gave its possessor an advantage, the slime cells gradually, through the action of natural selection, became localized in the pharyngeal region, and this gradually became enlarged and was thus set apart at a very early period as a specialized region of the gut.

It is also probable that at a very early stage in the phylogeny of these primitive chordata, a blind diverticulum was developed, behind the pharynx, to catch and retain long enough for perfect digestion, the food particles as they were hurried past with the stream of water, and that the rudiment of the

organ which has in the higher vertebrates become the liver was thus established.

In these primitive animals the current of water through the digestive organs was most useful, as the vehicle for floating food, but while necessary it was a necessary evil, for the large, distended lumen which furnished it with a channel also permitted undigested food to be swept away and lost.

The immovable, permanently distended, ciliated, digestive tract of a modern lamellibranch is very similar to that of these primitive chordata, but the lamellibranchs have acquired an apparatus for straining off the water from the captured food, so that the digestive tract is relieved from the disadvantageous current.

If, after the pharynx had been established, a secondary opening from it to the exterior were to be found, this opening would permit the water to escape without passing through the intestine, and as the advantage of this new arrangement is obvious, there can be no doubt that after an opening of this sort was once formed, it would be preserved and perfected by natural selection, as a channel for the escape of the water after the food has been strained out and entangled by the excretion of the pharyngeal slime glands, and that, after an useful opening of this sort had been fixed and preserved by natural selection on one side of the body, the laws of growth would soon cause it to be duplicated on the other side. These two openings are the so-called gill-slits of the primitive chordata.

I am not able to suggest what led to the establishment of a secondary opening into the pharynx, but, once formed, its preservation and gradual improvement, by natural selection, as a channel for the escape of superfluous water, and its duplication on opposite sides of the body, are easily intelligible.

If we accept the view that the chordata type was evolved under purely pelagic influences, we are forced to believe that the first chordata were minute, and that their small bodies were soft, and unprotected by a hard covering. If we also admit that their digestive tract was a channel for a current of water, we can hardly believe that they needed respiratory organs or for that matter, excretory organs, for all the tissues of a minute soft animal, bathed within and without by pure water, must have been sufficiently aerated and purified without any organs for this purpose.

It is not at all probable, then, that the pharyngeal clefts were originally either gills or renal organs, and we have seen that the conditions of pelagic life furnish a much more simple explanation of their advantage, and I believe that the view that they were originally concerned in nutrition rather than in respiration, will commend itself to all who approach the subject without any philosophical preconception.

After they were once established they gradually effected a rearrangement of the slime cells and ciliated cells of the pharynx, for as it now became important that all the food particles should be entangled by the product of the slime cells before it reached the pharyngeal clefts, the slime cells were gradually restricted to the anterior part of the pharynx, while the ciliated cells became gradually specialized to carry the entangled food past the openings and to convey it safely into the œsophagus. All the parts of the pharynx of appendicularia are beautifully co-ordinated for the purpose.

The pharyngeal clefts are situated far back in the pharynx, and are separated by nearly its whole width from the œsophagus. They are fringed by large cilia to expel the water, and they are separated from each other by a vertical shelf or velum from the ventral floor of the pharynx, so placed as to permit cross currents.

In front of this shelf the slime cells are brought together in two rows, near the middle line, just inside the mouth, to form the hypopharyngeal band or endostyle. Between these two rows of slime cells there is a median row of large, ciliated cells, so placed that they drive the slime forwards to the point where a ciliated, peripharyngeal band receives it and carries it up each side of the pharynx just behind the mouth, in the most favorable place for entangling the food as it enters with the current of fresh water.

On the dorsal middle line the threads of slime are gathered up and guided along the epipharyngeal band or dorsal lamella, beyond the influence of the current of water which sets backwards, on each side of the ventral velum, to the pharyngeal clefts, and the food is thus safely conducted into the œsophagus while the water escapes.

Up to this point I believe that the ancestral history of the tunicates was identical with that of the vertebrates, for the hepatic diverticulum, the dilated pharynx, the pharyngeal clefts, the hypopharyngeal gland and the peripharyngeal bands have been inherited by all the chordata, and have impressed themselves so firmly in their organization that even the highest vertebrates still retain them, either as rudiments or as organs which have been fitted to new functions.

I believe, however, that, while they were acquired before the tunicates diverged from the chordate stem, they were acquired by an organism whose environment and habits of life were essentially like those of the modern appendicularia.

All the parts of the pharynx of appendicularia are so beautifully co-ordinated for effecting a purpose so useful and so well adapted to the conditions of its simple pelagic life, that we find it difficult to resist the belief that its ancestors had essentially the same habits and that they lived under essentially the same conditions, and that this simple organization was directly acquired in adaptation to these conditions.

If this view involved any great or unusual difficulties we might well distrust it, notwithstanding its simplicity; but I shall try to show that it does not. In another publication I shall show that it accords with our knowledge of the fundamental principles of the general biology of the ocean, and also that it is equally in accord with the principles of morphology, although a very different view has been advocated by Dohrn.

I have tried to show that the structure and the anatomical relations of this system of organs in the tunicates are quite consistent with the view that they were originally acquired for the purpose which they now serve—the capture of food.

The simplest explanation of their origin is that which attributes them to the preservation, by natural selection, of a long series of slight changes, each of which improved their adaptation to the simple conditions of primitive pelagic life.

Dohrn disputes this position and says that "many persons would have great difficulty in believing that this simple mechanism is primitive" (Studien, etc., VIII, p. 62). The

future must show how many of these persons there are, but I shall now lay before them Dohrn's own explanation, that they may make their own comparisons.

"We ask," he says (p. 62), "how the ancestors of the tunicates obtained their food before the endostyle was formed. Obviously they were free swimming animals, and therefore in the position to seize their food by hunting. It is as certain that they needed other contrivances than the ciliated furrows and the slime gland, as it is that the ancestors of the cirripeds sought their food in some other way than by the formation of little vortices to sweep into their mouths everything within their influence. The limbs of the swimming forefathers of the cirripeds were certainly different from the cirri of modern barnacles; even so were the ancestors of the tunicates differently constructed from the modern ones, and before the slime gland and the ciliated grooves became the exclusive means of nutrition, they must have been the accessory aids to some more primitive mode of capturing food."

"Ammocœtes lives in the sand, into which even the youngest larvæ bore. Although direct observations fail, it must be assumed that the excretion of slime and the ciliation have some advantage in the nutritive or respiratory functions of organisms which live in the mud.

"May we not believe that, in spite of the sifting through the oral tentacles and the velum, the hard particles of sand would be injurious to the delicate epithelium of the gut, if this were not protected by a thick coating of slime; that the ciliated furrows are adapted for conveying this slime to the most exposed spots, and that in this function they have their starting-point? Once brought into existence, it is not remarkable to see these useful structures further evolved, until the whole mass of food is invested with a slimy admixture to facilitate its passage through the gut. It is not impossible that besides acting mechanically as investment, the slime also acts chemically as an aid to digestion. If this is the case, it is easy to understand how a peculiarity so useful to sedentary animals like the ascidians, or to floating ones like the salpæ, gradually assumed the whole function of nutrition. Thus the problem of the change of function is solved."

Although it seems as if the delicate walls of the gut of a burrowing animal would be more effectively protected if slime were directly excreted "upon the most exposed spots," than by this highly specialized system of organs, we might yet believe that the system "has its starting-point" in the habits of ammocœtes, if we did not find evidence of descent from an ancestor in which it had attained, not a starting-point merely, but its full development, in the structure and embryology of every chordata animal which is known to exist.

The ontogenetic evidence that the vertebrate thyroid body was at one time a pharyngeal gland opening just within the mouth, and the discovery by Dohrn of rudimentary peripharyngeal grooves in the torpedo embryo (Studien, etc., VIII, Plate H, figures 7*f*, 7*g*, 7*h*, 7*i*), seem to me to be convincing proof that these organs did not have their starting-point in the habits of ammocœtes, nor in any degenerated fish, but that they arose in a lineal ancestor of the selachians and higher vertebrates, which was also an ancestor of the tunicates and cyclostomes.

Passing now from the biological relations of the system of the endostyle, to its homologies, we are told by Dohrn that it is equivalent to two pairs of gill-slits; that these gill-slits are present and functional in the fish-like ancestors of the cyclostomes and tunicates, and that two of them, the mandibular clefts, moved downwards and met on the ventral middle line to form the thyroid gland or endostyle, while the endodermal portions of the others, the spiracular clefts, lost their connection with the exterior, and became connected with the peripharyngeal grooves (Studien, etc., VII and VIII).

Homologies are expressions of genetic relationship, and Dohrn tells us, Ursprung, p. 79, that they are valuable in phylogeny only as they furnish us with the opportunity to pass from the consideration of the structure of organs at the present time, to the consideration of the conditions which have passed away; to the history of the modifications which have come between these structures and functions and those which we must attribute to the same organs at an earlier genealogical stage.

I regard the structures which we find in the tunicates and in ammocœtes as primitive, and as homologous with those which we find in the jawed-vertebrates, and I have tried to trace the history of the modifications which have come between these structures of modern vertebrates and those which we must attribute to the same organs at an earlier genealogical stage, in the primitive history of the ancestral, pelagic chordata. The reader must judge of my success.

Let us now see what light Dohrn's homology throws on the history of these primitive modifications.

He tells us (Studien, etc., VII, p. 47) that he will point out farther on the significance of the changes which have led to the fusion, on the middle line, of structures which were originally paired, but I have been able to find nothing more upon this point except the acknowledgment on page 63 that "I frankly admit that I have at present no available argument to bring the peculiar organization (of the ciliated grooves) of ammocœtes from a pair of imperforated (spiracular) gill-slits, into accordance with the concept of change of function; and that the origin of the slime gland of ammocœtes from two ventrally fused (mandibular) gill-slits must for the present remain an unsolved problem."

Whatever may be thought of my own view, it must be admitted that Dohrn's homology of the endostylic system with two pairs of gill-slits has very little phylogenetic value, even when measured by his test: the opportunity it furnishes for passing from the structure and functions of modern organs to the history of earlier genealogical stages.

Dohrn's memoirs upon the thyroid body are full of interesting anatomical details, such as the similarity between the thyroid body of shark embryos, and the true gill-slits, in their relations to the cartilages, the muscles and the blood supply (VII, p. 44), and the resemblance between the peripharyngeal grooves of ammocœtes and the spiracular gills of selachians (VIII, p. 55); but as he admits that the annelidan hypothesis leaves the origin of the endostylic structures an unsolved problem, our subject does not require us to enter into the discussion of these complicated details of vertebrate morphology.

STRONTIUM BROMIDE IN THE TREATMENT OF CHRONIC EPILEPSY.

By Henry J. Berkley, M. D., *Visiting Physician, City Insane Asylum.*

The constantly increasing number of incurable epileptics, both in asylums and at large, occasions an ever-growing demand for new drugs, from which we may at least hope to effect some improvement, in either their psychical condition, or a diminution of the number of seizures.

Among the recent applicants for medical favor in this line has been the bromide of strontium (Paraf-Javal), purporting to be a salt, free from the impurities of the ordinary commercial article which render it unfit for continued use, or even poisonous in moderate doses. This statement as to its non-toxic action we have found to be well founded, no evil result having followed 30-grain doses repeated thrice daily, and no case that has been treated with the salt has shown other than beneficial results. Above all, we have to note continued absence of a bromide acne (even disappearance of the rash, though it was present when the use of the strontium was commenced), a very much lessened somnolent effect, the patients without exception appearing brighter and more cheerful under its use than with the sodium salt, and finally certain excitable cases were less quarrelsome after a seizure, than under the every-day treatment; points all of very considerable value, both in private and asylum practice.

We have not been able to determine that the actual character of the seizures, when they do occur, is altered to any extent by the strontium salt, though some of the attendants were of the opinion that the convulsions were lighter in character than before the treatment was inaugurated, but it remains an uncertain point, the opinions being too much at variance to be of value.

In the September past, at the commencement of our experiment, we found in the City Insane Asylum thirty-six chronic epileptics, the majority being of many years' standing. At this date the whole thirty-six were treated with what is known as the "house epileptic mixture" which contains gr. xx. of sodium bromide and gr. xv. of potassium iodide to the tablespoonful, and which was given in this dose three times a day. A census of the thirty-six cases was made, and eleven of the worst and most regular epileptics were selected for the new treatment. These were, however, kept under the sodium bromide for four weeks longer, and the number of seizures that occurred daily were noted down by the attendants on charts especially prepared for the purpose. At the end of the fourth week, the treatment was changed to a solution of natrium chloride (gr. x. to ½ oz. water) t. i. d., upon which the eleven were kept for ten days. During this time the number of attacks increased greatly, and elicited the remark from one of the attendants that "they fall around like sheep." One curious point is to be noticed in the sodium chloride treatment, namely, that in the last two days during which it was administered, but one patient (J. P.) had a seizure. However, the very next day they began afresh, and it would therefore seem that the nervous centres had to some extent become temporarily exhausted. It is also to be noted that at the end of the ten days the eleven patients were generally in a decidedly worse mental and physical condition than under the sodium bromide.

On the first of December the selected patients were placed on a solution of strontium bromide (kindly furnished for the purpose by Messrs. Fougera, of New York), and within a few days a decided improvement became manifest in all except two cases (F. B. and M. W.). All were treated in precisely the same way, receiving 21½ grs. of the salt thrice daily. The dose with F. B. was within a day or two increased to 30 grs., when he also followed in the train of the nine. On December 20th, owing to the unfortunate miscarriage of a letter, the treatment had temporarily to be discontinued, and from this date to the end of the month no medicine whatever was administered. During these ten days a gradual rise in the number of convulsions was noted. In the first seven days the rise was exceedingly slow, in the last three days 16 seizures occurred, one patient alone having three.

On December 1st, a new supply of the bromide having been obtained, the treatment was recommenced and continued through to January 31st, 1893, without interruption. In October, under the sodium bromide, the eleven had 81 convulsions, in December there were 55 seizures, in January 65, marking a decided fall and very gradual rise for the entire number. This statement is vitiated to a degree by the non-amenability of Weinecker, Kinzer, and Schreck, and the inclusion of a case of Jacksonian epilepsy (Wasch) in the list. Excluding the cases of Weinecker and Wasch, we have the following statement: In October 76, in December 32 fits, in January 44 fits. With Weinecker the strontium treatment seemed to be of positive disadvantage. With Wasch, who has a gross lesion of the cerebrum, it seems to have had no influence either for good or evil.

With several other epileptics the strontium treatment was tried, but less systematically, partly owing to the patients at times refusing to take it; but in all to whom it was given an improvement has been noticed, both in the diminution of the number of fits, and in their increased mental brightness. One, a most unmanageable case (J. K.), with postepileptic stupor lasting for a number of days after each attack, has improved very greatly mentally, and the number of seizures has diminished.

It is but fair to state that the *personnel* of the attendants of the Asylum is not all that could be desired, and that absolute reliance is unfortunately not to be placed on all their observations, and it is well to bear this in mind in drawing conclusions of the results of the strontium treatment. In one small ward, however, there is an exception, the attendant being very faithful and observant, and it was precisely in this same ward that the strontium salt gave its best results. In this department were the chronic epileptics, Gray, Beam, White and Chew. In October, under the sodium bromide the total number of seizures of the four numbered 37, in December 7, in January there was a rise to 18, less than one-half that of October.

An explanation may be necessary for the following histories; their indifferent character arises from the fact that up to 28 months ago no systematic histories of the patients in the Asylum were kept, and that, with two exceptions, the epileptics chosen for the experiment were admitted to the institution before that date, and no antecedent histories were obtainable.

Chas. Kinzer, aged 40, w. m. Imbecile. Parents are both dead, of unknown causes. No known heredity or neuroses in the family. Admitted Sept. 14, 1878. Cause of fits unknown. Has attacks of grand mal, averaging three weekly. Convulsions are limited to the right side of body. The seizures average two minutes in duration and are followed by stupor for a few minutes. There is no mark of injury to the skull. Patient has been on bromides since date of admission. There is now complete dementia. The effects from the strontium treatment have been nil.

Ed. Wasch, aged 54, w. m. Cigarmaker. No neuroses in family. Cause of epilepsy, a depressed fracture over the posterior left temporal region, caused by a fragment of shell during the civil war. Grand mal, averaging one series of attacks weekly, occurring in quick succession, sometimes as many as ten in a day. Convulsive movements begin in the muscles of the left face, then extend to the arm and leg, finally the whole body becomes convulsed. There is an aura as if a bucket of water had been poured over his head. Bromides off and on since 1863. The effect of the strontium treatment has not been marked.

C. A. Shreck, aged 33, w. m. Watchman. Cause, injury to head when a child. Has had fits since ten years of age. Petit mal and grand mal. Convulsive movements are more marked on left than on right side. Seizures occur day and night. The duration of the convulsion varies from the fraction of a minute to several minutes. Has been on bromides for a long time. Post-epileptic excitement and complete dementia. Benefit from the strontium has been slight.

Wm. Gray, aged 17, b. m. Laborer. No known heredity or neuroses, cause unknown, duration unknown. Patient is an imbecile. The convulsions are general, lasting from one to two minutes, after which he is confused and quarrelsome for several hours. Very considerable improvement under strontium treatment.

F. Beam, aged 45, b. m. Messenger. No ascertainable heredity or neuroses in family. Cause unknown, has had epilepsy since the age of 14 years. There is considerable mental deterioration. General convulsions lasting from one to two minutes, after which he is very excited and dangerous. He has an indistinct aura as if he were in the act of stepping into a carriage, the bottom of which falls through when his foot touches it. This aura apparently comes on in the form of a dream and has been constant for a year only. Has been very greatly improved by the treatment, the attacks are greatly diminished and he is far less quarrelsome.

Isaiah White, aged 16, b. m., epileptic idiot. No history. Convulsions general and severe. Has command of only a few words. The number of seizures has been considerably diminished.

Chas. Chew, aged 32, b. m. Imbecile. Has been an inmate of the poor-house since a mere boy. No history obtainable. Has an average of two fits weekly. Convulsions general, lasting about two minutes. Is confused for an hour or more. Has been on bromide treatment for many years. The number of convulsions has been considerably lessened by the strontium treatment.

Helen Luft, aged 45, w. f. No occupation. Father is said to have died with paralysis, the mother of cancer. Epilepsy followed measles at the age of six years. Convulsions general. Patient is considerably demented. Patient has improved considerably under the treatment.

Jennie Peterson, aged 32, w. f. No history obtainable. Has both petit and grand mal. Convulsions general. Fits since the age of seven years. Bromides since 1885. Is demented. Has not improved much under the treatment.

M. Weinecker, aged 36, w. f. No history obtainable. Has an average of one fit daily. Convulsions general, and is very quarrelsome afterwards. Is much demented. Treatment without result.[1]

Dora Yocum, aged 40, w. f. No history. Imbecile. This case was probably the worst epileptic in the institution, having one seizure regularly every day and sometimes as many as half a dozen. Convulsions general. After an attack is obstinate and quarrelsome. Former treatment, bromides in all forms for years. Has improved greatly, attacks occur at comparatively rare intervals, and is comparatively bright.

One point is clearly seen in the tabulated statement, namely, that the strontium bromide has claims to considerably greater merit in lessening the number of epileptic seizures than its companion salt the bromide of sodium; but to me the improved mental condition, lessened somnolence and excitability, are of far greater moment than the actual diminution of the fits. The experiment shows that the salt is worthy of an extended use, and that certain cases may be greatly benefited by it.

In conclusion, I have to thank Dr. Edward Garrett, the resident physician, for his kindness in tabulating the reports, and for keeping a general supervision of the experiment while it was in progress.

FEB. 23, 1893.

SUMMMARY.

NAME.	October.	November.	December.	January.
C. K	5	11	4	7
E. W	0	7	5	4
C. S	6	5	4	7
W. G	7	3	2	4
F. B	8	10	0	3
J. W	11	3	3	6
C. C	11	2	2	5
D. Y	16	13	3	2
H. L	8	9	7	4
J. P	4	6	7	6
M. W	5	16	18	16
Totals	81	85	55	64

NOTE.—From Oct. 1st to Oct. 28th sodium bromide gr. xx. and potassium iodide gr. xv. three times daily.

From Oct. 28th to Nov. 7th sodium chloride gr. x. three times daily.

From Nov. 7th to Nov. 20th strontium bromide 21½ grs. 3 times daily.

From Nov. 20th to Dec. 1st all medicine was discontinued.

From Dec. 1st, 1892, to Feb. 1st, 1893, strontium bromide grs. xxij. three times daily.

[1] May 15, 1893.—A complete change has taken place in the character of W. in the past few months. The fits occur only about once in four weeks, and from being untidy and excessively quarrelsome, she is now neat, helpful, and good-humored. The strontium bromide has at this date been used with thirty-eight epileptics in the Asylum, and the results obtained have been better with all than with the other bromides. Cases where it has been in use for five months show no inclination to an increase of the seizures, nor a falling back to somnolent or quarrelsome states.—H. J. B.

PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Meeting of February 20th, 1893.

Dr. HURD in the Chair.

Haematoma of the Sterno-Cleido-Mastoid Muscle in an Infant.—Dr. BOOKER.

This child is 7 months old and is fairly well grown and nourished. He has congenital heart affection, which has not yet caused any trouble. He has not had any special sickness, and there is nothing in the family history to be noted. The child was born with feet foremost, and the mother attended in the labor by a midwife.

He was brought to the Dispensary six weeks ago to be treated for swelling on the left side of the neck, which, at that time, felt almost as hard as cartilage, but it is not so hard now and appears somewhat smaller. The swelling occupies the middle and upper part of the left sterno-mastoid muscle, and is somewhat larger than a pigeon's egg. It was first noticed three or four weeks after birth. It is not sensitive to pressure, and the only symptoms are inclination of the head to the healthy side, and slight difficulty in nursing when the child is placed to the breast on his left side.

Swelling with induration of the sterno-cleido-mastoid muscle in the new-born is not of frequent occurrence, and is not generally recognized in this country, although it has been described in German literature since 1830. It is caused by mechanical injury to the muscle in the act of birth, by which the muscular fibers or blood-vessels are torn in pulling on the neck to disengage the parts remaining behind. It occurs much more frequently in breach than occipital presentations, and the right muscle is more often affected than the left. In some cases both muscles are affected, one being more swollen than the other.

According to Qvisling (Archiv f. Kinderheilk. 1891), the right or left muscle is injured according to the side of the neck subjected to the most strain in delivery. In breech presentations the greatest tension is upon the side of the neck remaining posterior, which is the right side of the neck for the most common position in breech presentations. On the contrary, in occipital presentations the side of the neck which comes anterior suffers the greatest strain when the head is pulled upon in delivering the shoulders, and this also is the right side of the neck for the most frequent position in occipital presentations.

While this affection occurs chiefly in cases attended by midwives, and as result of imprudent traction on the neck in delivery, it has occurred in spontaneous delivery, which has led to the opinion that certain conditions of the child, such as those occurring in congenital syphilis, may act as predisposing causes, rendering the muscular fibers and blood-vessels more easily torn, but sufficient number of cases have not been collected to connect any condition of the child with special liability to the trouble.

The swelling is seldom noticed before the third week after birth, and may not be for a much longer time. It runs a chronic course, gradually disappearing in a few months, but in some cases it may last for a year or longer. It does not cause any inconvenience to the child, and is chiefly of importance in relation to wry neck. As a rule recovery is complete, but it is probable that in some cases contraction of the injured muscle may occur, resulting in wry neck, and Henoch has seen two cases followed by the latter affection.

From microscopical examination of the injured muscle in children who died from other causes, it appears that the induration is due more to inflammation of the muscle than blood effusion, and Qvisling suggests the name "Myositis musc.-sterno-cleido neonatorum" as more appropriate than Hæmatoma or Induration. In mild cases the delicate muscular fibers alone are torn, giving rise to the inflammation, but in the more serious cases there may be considerable effusion of blood under the sheath of the muscle, forming a true hæmatoma, and in these cases there is also inflammation of the muscle.

A Case of Combined Diphtheria, Measles, and Chicken-pox.—Dr. BOOKER.

The family in which these diseases occurred consisted of four children, the oldest 9 years old, the youngest 18 months.

October 29, 1892, the third child, 3 years old, was brought to the Johns Hopkins Hospital Dispensary, having what appeared to be a typical case of follicular tonsillitis, but proved in a few days to be diphtheria, which subsequently extended into the larynx, requiring intubation. A piece of false membrane removed from the throat when the tube was inserted gave almost a pure culture of the virulent diphtheric bacillus. The child completely recovered in four weeks, and the two oldest children, who had been removed from the house, returned home. The mother was warned not to allow the other children to go into the sick-room during the rest of the winter, but the feeling of security afforded by the large amount of sulphur consumed in fumigating the room by the health-officer rendered this advice useless.

December 13 the oldest child had chicken-pox, which lasted ten or twelve days and ran a mild course.

December 21 the second child had measles, the eruption extending over the body by the following day. He was removed into the Hospital, December 23, and had chicken-pox, January 1, 1893, just as he was recovering from the measles. Both diseases ran a mild course.

December 21, the day on which the eruption of measles appeared on the second child, I was requested by the mother to examine the youngest child, aged 18 months, who she thought was also getting sick. The child was feverish, but free from symptoms of the catarrhal stage of measles. He was bright and lively, had good appetite, slept well, had no cough or coryza, and did not appear to be sick. Upon examination, the throat was found to be red, and thick, yellowish-white pseudo-membranous deposits were seen on the tonsils and pharynx, cultures from which gave chiefly diphtheric bacilli and few streptococci. The child continued to do well, was lively and playful, and nursed exclusively at the breast up to December 28, when he was taken with restlessness, fever, cough, coryza, and the throat, previously comparatively dry, was choked up with secretions. The child refused the breast altogether, but would drink out of the cup. At this time, December 28, the pseudo-membranes in the throat had commenced to disappear.

December 29, one vesicle of chicken-pox appeared on the inner side of the thigh, and in twenty-four hours the eruption extended moderately thick over the body.

December 31, the eruption of chicken-pox beginning to dry; the pseudo-membranous deposits in the throat almost entirely disappeared, but a fresh, white deposit was noticed on the posterior surface of the epiglottis; child had considerable fever, cough, coryza, and conjunctivitis.

January 1, 1893, eruption of measles appeared on the face, neck and arms. In some places the patches of measles were by the side of, or surrounded the vesicle of chicken-pox; throat almost entirely free from false membrane, except on the epiglottis, where it seemed to be spreading.

January 2, eruption of measles quite profuse over body; eruption of chicken-pox disappearing; toxic symptoms beginning to appear. The child was pale, listless and drowsy; would not take food, and nourishment had to be given through the stomach tube; pulse very weak and rapid. Breathing labored, croupous, and accompanied with recession of soft parts of the chest. Intubation performed, which gave relief to the breathing.

January 3, respiration easy; toxic symptoms more decided; eruption of measles unchanged; eruption of chicken-pox almost entirely disappeared.

January 4, morning visit, eruption of measles fading; no signs of chicken-pox; pulse very feeble; respiration quickened, but not obstructed.

Death at 4 P. M. Autopsy, at 6 P. M., by Dr. Flexner, who will report the result of the autopsy and pathological histology at a future meeting of the Society.

Remarks.—The child had diphtheria alone for one week after he was first examined, and probably several days before that time, during which he was bright and playful, had good appetite, nursed at the breast, and from his appearance, without special examination, would not have been considered ill.

The stage of invasion of measles and stage of eruption of chicken-pox began at the same time, about the eighth or tenth day of the diphtheria, and marked the first appearance of illness. At this time the pseudo-membranous deposits in the throat had commenced to disappear, and in four days later had almost entirely disappeared, with exception of the patch on the right tonsil.

The measles ran a normal course, the stage of invasion was the usual length, four days, and the eruption began to fade in four days from the time of its first appearance.

The chicken-pox disappeared in a shorter time than usual.

The diphtheria was no doubt unfavorably affected by the other diseases, especially measles. After the throat had become nearly free from the old pseudo-membranous deposits, fresh deposits occurred with the first appearance of the eruption of measles. These deposits began on the epiglottis and extended down into the air passages and upward over the pharynx and tonsils, which had been nearly clear of the original pseudo-membranes for several days. The last examination of the throat was made when the intubation tube was introduced, two days before death. At this time the only part of the original pseudo-membrane remaining was a small patch on the right tonsil; the rest of the throat was clear with exception of the fresh deposit on the epiglottis. At the autopsy Dr. Flexner found fresh pseudo-membranes covering the pharynx and tonsils, and on the right tonsil, where the remnant of the original pseudo-membrane was peeling off, a fresh pseudo-membrane was forming on the tonsil underlying it.

It is highly probable that the condition of the throat and air passages resulting from the effects of measles favored the extension of diphtheria into these parts.

Gastro-Enterostomy for Cicatrizing Ulcer of the Pylorus.—Dr. FINNEY.

The patient, Mary G., colored, aged 22, was admitted to the medical side of the Johns Hopkins Hospital, July 28, 1892. She complained of a "lump" in her stomach and "vomiting spells." Her history, condensed from the medical records, is as follows: No tuberculosis or cancer in her family, as far as she knows. Was a healthy child. Had measles and whooping-cough when young. Menstruation began at the age of 11 and has always been regular and painless. Eight years ago had a slight attack of "pneumonia," and a year later "chills and fever." Her occupation is housework.

Her present illness began three and a half months ago with a loss of strength and weight. At about that time the "lump in the stomach" first made its appearance, and has since increased somewhat in size. Following this, vomiting began, at frequent intervals, not accompanied by much nausea and affording great relief. Vomitus at first greenish, later watery and containing particles of undigested food, no blood. Taking food brings on the paroxysms. No acid eructations. Appetite very poor, bowels constipated. Slight dyspnœa on exertion. Has lost much weight. No renal, cardiac or pulmonary symptoms complained of.

Physical Examination.—Rather emaciated, lips and mucous membranes pale, tongue has a slight whitish coat. Pulse 92 and regular. Lungs clear. Heart sounds rather weak, soft systolic murmur heard all over cardiac area. Liver dulness contracted. Splenic dulness about normal. Abdomen symmetrical, not distended. In the right hypochondrium, just below the costal margin and opposite the cartilage of the eighth rib, is a small nodule, apparently the size of a horse-chestnut. This descends slightly with each inspiration, and gives one the impression of being situated at the pylorus. Its consistence seems to vary. Examination, after having inflated the stomach, reveals a marked increase in the area of gastric tympany, extending from the fifth rib above down to three finger-breadths below the umbilicus. Owing to the tenseness of the distension, the position of the nodule above mentioned could not be accurately determined. It did not appear, however, to be in its former position. Urine negative. On August 2, after a test breakfast, 300 cc. of a cloudy fluid, with a decidedly rancid odor, were obtained from the stomach. The fluid contained undigested fragments of bread and curds of milk which had been ingested the day previous. No free hydrochloric acid. Lactic acid present.

The patient was transferred to the surgical side, August 19, 1892. During her stay in the medical ward her condition had not improved. Surgical interference was therefore deemed advisable. For the thirty-six hours immediately preceding the operation she was fed by enemata alone. In the morning of the day of operation the stomach was thoroughly irrigated with a boric acid solution. Abdomen prepared in the usual manner. Operation, August 26, 1892. Ether. The abdomen was opened through a median incision extending from the ensiform cartilage to the umbilicus. The stomach presenting, appeared to be empty and not much dilated. Its walls normal except towards the pyloric end, where they were found to be the seat of an extensive, diffuse infiltration, densest at the pylorus itself, where it formed an elongated mass 4–5 cm. in diameter, moderately firm and resistant to the touch.

This thickening extended along the lesser curvature for rather more than half its length, and about the same distance along the greater curvature, thus involving perhaps one-half of the whole stomach. The duodenum adjacent to the pylorus was similarly affected, and bound by adhesions to neighboring structures. The neighboring lymph glands were enlarged, and one was removed for examination. Presection sutures having been first inserted and drawn aside, according to the method suggested by Dr. Halsted, a small incision was made through the anterior gastric wall, and a finger inserted in order to explore the mucous surface. The pylorus was found to be contracted to such an extent that it would not admit more than the tip of the examining finger. The mucous membrane felt uneven and eroded.

The incision was then enlarged sufficiently to admit of an inspection of the parts. The stomach was found to be empty. The mucous membrane in the neighborhood of the pylorus was much congested, ulcerated, and thrown up into folds, with several large branching polypi almost completely blocking the outlet. Portions of the growth, including the whole thickness of the stomach wall, and one or two of the polypi, were excised for examination. Digital dilatation of the pylorus was then performed after the manner of Loreta, until it would admit the tips of three fingers. This was slowly, but quite easily, accomplished. The incision was then closed by tying the presection sutures before mentioned, and the insertion of a few additional ones. The report of Drs. Councilman and Flexner, who had been examining frozen sections of the specimens removed, confirmed our opinion as to the non-cancerous nature of the growth. The fresh sections showed an enormous hypertrophy of the muscular coats, fibrous thickening, and round cell infiltration. Diagnosis, probably cicatrizing ulcer of the pylorus.

The very extensive small round cell infiltration, however, suggested the remote possibility of its being a malignant lymphatic growth. Had such been the case it would have been impossible to

have removed the whole growth without sacrificing considerably more than half of the stomach. The strong probability of its being benign, however, led me to abandon the idea of excision. In order to obviate any possible trouble which might follow a subsequent contraction of the pylorus even after thorough dilatation, an anastomosis between the stomach and intestine was established by the operation of gastro-enterostomy.

Owing to adhesions, the duodenum was not available. A loop of small intestine was then caught up and joined to the anterior wall of the stomach at about its mid-point, by Dr. Halsted's method of lateral intestinal anastomosis.[1] Twelve quilted sutures were placed on each side, 24 in all, and the posterior row tied. An opening from 5 to 6 cm. long was then made into the stomach, and a corresponding one into the intestine, and the operation completed by tying the anterior row. During the tying of the sutures the cut surfaces of the stomach and bowel were continuously irrigated with a warm sterile salt solution. The abdominal wound was closed in the usual manner, with two rows of buried silk stitches. Time, 2 hours.

The patient reacted well; she was given a large enema of warm salt solution and whiskey upon reaching the ward. Nutrient enemata were ordered, to be given every 4 hours. A good deal of abdominal pain was complained of during the afternoon, which was relieved by a small hypodermic of morphia, repeated during the night, which was passed fairly comfortably. She vomited several times.

Next day only slight nausea, pulse good, no pain. Temperature normal. Her convalescence progressed very satisfactorily from this time until about the tenth day. Five days after operation she was allowed milk and lime-water in small doses, frequently repeated. Ten days after operation a slight diarrhœa was noticed. Nutritive enemata not so well borne, and hence omitted. For the next few days the diarrhœa steadily increased in intensity, with frequent and bloody stools, and accompanied by great tenesmus; and notwithstanding all efforts to check it, her condition grew rapidly worse, and on the fifteenth day she died.

Autopsy report, condensed from the autopsy records of the Johns Hopkins Hospital (autopsy by Dr. Flexner):

Anatomical Diagnosis.—"Cicatricial linear incision in median line of abdomen, extending from ensiform cartilage to within 5 cm. of umbilicus. Gastro-enterostomy; adhesion between abdominal wall, lower end of sternum, free border of ribs and projecting lip of right lobe of liver for 2–3 cm. Perihepatitis. Diphtheritic colitis. Fatty degeneration of liver, kidney and myocardium. Hypertrophy of muscle in pyloric region. Ulceration and stricture of pylorus; multiple mucous polypi in pyloric region; thickening and induration of pyloric region of stomach."

"No excess of fluid in peritoneal cavity. The transverse colon is displaced and occupies the left hypochondrium, and extends into the left lumbar region. There are a very few adhesions, easily broken down, over the pyloric region of the stomach, in which one end of omentum in part enters. Numerous old adhesions around the right lobe of liver. Black sutures are visible along a line in the pyloric region, and an anastomosis occurs 6 cm. from the pylorus, between the stomach at the greater curvature and the small intestine. The anastomosis was made with the small intestine 60 cm. beyond the duodenum. The first set of sutures, the one mentioned above, begins 2 cm. from the pylorus and extends 5 cm. towards the cardiac end. The incision necessitating these sutures is completely healed. The stomach at this point is much indurated and thickened. The organ as a whole is small in size."

"On section the muscular coat of the stomach is much hypertrophied, being 12 mm. thick. The thickening and induration extend to nearly the middle of the contracted stomach. The mucous membrane of the stomach is somewhat hyperæmic, thrown into folds, and the summits of the rugæ are in several instances decidedly hyperæmic. Corresponding with the indurated area described, but not coextensive with it, is an irregular ulceration in the mucous membrane, extending, in the largest one, which is 6 cm. by 2.5 cm., to the muscular coat. The edges of the ulcer are irregular, little islands of tissue projecting from the sides into the middle, but clean and free from necrotic material. The muscle is freely exposed in the floor of the ulcer. No especial hyperæmia around it. Smaller ulcers were seen close by, there were two or three such, the largest of these not exceeding 4 mm. in diameter, and the smallest not over 2 mm. These were limited to the mucous membrane and quite hyperæmic. There was one small ulcer, 5×8 mm. in size, which penetrated to the muscle, the edges being undermined for a short distance. This was likewise clean and devoid of necrotic material. In the greater curvature of the stomach, 6 cm. from the pylorus, 15 cm. from the œsophagus, and 4 cm. from the lesser curvature, is an anastomosis between the small intestine and the stomach at this point. A ring-like orifice is present, complete union having occurred between the structures. The black silk used for suturing is visible in the mucous membrane. No suppuration, hyperæmia nor extensive adhesions present about this area. Several small mucous polypi in region of ulcer. The intestines of the circle formed in consequence of the anastomosis, normal. The small intestine normal throughout up to within 30 cm. of the valve, where the ileum shows hyperæmia, hæmorrhages into the mucous membrane and minute losses of substance, with the tissue about swollen, hæmorrhagic and apparently covered by a granular exudate. The cæcum is intensely reddened, its mucous membrane is swollen, there are more extensive losses of substance, appearing gray in contrast with the hæmorrhagic mucous membrane about it, and a coating of what is apparently fibrin (and blood) can be scraped from the surface. The rest of the large intestine is similarly but less extensively affected, excepting particular patches in the sigmoid flexure where the condition is equal to the cæcum. Appendix normal. The rectum is about the same as the large intestine below cæcum; however, a few cm. above anus is a patch of necrosis in mucous membrane 3×2 cm., of green color, no actual ulcer. Mesenteric, retroperitoneal and gastro-hepatic glands somewhat enlarged."

Dr. Thayer, under whose care the patient was while in the medical ward, has reviewed the case and called attention to some of its interesting clinical features. From a surgical standpoint not the least interesting points noted were the presence of the mucous polypi in the ulcerated and constricted pylorus, and their possible significance; the immense amount of muscular hypertrophy and fibrous thickening, and the extent of surface involved; and the development of a diphtheritic colitis following so closely upon a severe operation, involving extensive injury to portions of the intestinal tract.

Dr. Osler.—I saw this girl on the day of my return, the 19th of August, with Dr. Thayer. She had a history of vomiting and marked failure in health, and looked a miserable, emaciated creature in a wretched physical condition. At the time of my examination the stomach was very greatly dilated and no nodular mass could be felt. Dr. Thayer had noted the presence of a small nodular mass in the left hypochondriac region. On my return two weeks later that mass was quite evident. It was slightly hard and not painful. It was difficult to get a history from her of gastric illness of longer duration than two or three months. It seemed to be a very favorable case for dilatation of the pylorus. She certainly did well after the operation until the diarrhœa developed.

Dr. Halsted.—I did the same operation in a case of cancer and it healed up very nicely without adhesion. It is not often that one can get a result without adhesions, and I am very much pleased to see that Dr. Finney did the operation so satisfactorily.

Dr. Flexner.—Dr. Councilman and myself were present when Dr. Finney opened the stomach. When he everted the mucous membrane we were able to see a number of mucous polypi. The Dr. removed a mucous polypus and enough of the wall of the

[1] Johns Hopkins Hospital Bulletin, Vol. II, No. 10.

stomach to enable us to make a positive diagnosis of cicatrizing ulcer. At the autopsy very few polypi were present, and what had become of them we were not able to say. The ulcer at the time of the autopsy was quite small. The muscle of the stomach was very much thickened just above the pylorus. There were two very small superficial ulcers beyond the original ulcers which had not perforated beyond the mucous membrane.

Meeting of March 20, 1893.

Dr. HURD in the Chair.

Dr. W. B. PLATT exhibited the following cases:

1. A Case of Contracted Finger after a Burn.

C. H., æt. 5 years, was admitted to the Garrett Hospital for Children, February 21, 1893, with a history of a burn of the left hand from drawing it across a hot stove in November, 1892.

The third finger of the left hand is completely flexed on the palm, and bound down by cicatricial tissue so as to be perfectly immovable. The middle finger is less involved. It can be two-thirds extended. The phalanges can be brought into line with each other but not with the metacarpus. The forefinger is also involved in the cicatricial web binding down the other two, but to a less extent again. The bones of the thumb are in a straight line. The thumb is, however, strongly adducted. It is tied up in the web of scar tissue involving the others just mentioned. The child is rickety in build; has weak spinal muscles, enlargement of both radial epiphyseal cartilages, and knock-knees.

This patient was operated upon March 8 to relieve deformity of hand. The scar tissue was divided in palm, and also opposite first phalangeal joint. The cicatricial tissue was loosened from beneath and drawn toward the ulnar side; a flap was cut from thenar eminence and drawn into the palm. This made it possible to nearly cover the remaining defect, upon which three skin-grafts were placed two weeks later. Three weeks from date of operation a granulating spot of one-fourth inch only was left. All fingers extended, and thumb in a much improved position.

2. Case of Infantile Paralysis, with Hyperextension of Leg on Thigh.

B. L., æt. 6 years, presents a case of great atrophy of extensor muscles of thigh, with retarded growth of leg and foot on right side.

There is a difference of one and three-quarter inches compared with the left side, in circumference of the thigh, a difference of one and three-quarter inches in calf, and five-eighths inch difference in length of foot.

The whole right limb is distinctly cooler than the left. The skin of the affected extremity is mottled. The foot on the affected side is abnormally movable in all directions. The right nates is flatter than the left. The unusual feature of the case is the extreme degree of hyperextension of the leg on the thigh; this amounts to 45 degrees. The boy was able to get about after a fashion by throwing the limb far forward, letting the knee bend backward as far as it would go, then bearing the weight on this over-extended knee. There was some degree of acquired talipes equinus.

The patient had his tendo right Achillis divided, February 9, a suitable brace adjusted a month later, and electricity applied daily for three weeks, at the end of which time he was able to walk much better than before.

3. A Case of Epispadias.

W. L., æt. 6 years, entered the Garrett Hospital for Children, February 18, 1893. He has complete epispadias. No extrophy of the bladder exists. There is no other visible abnormality about the patient. There is a well-developed glans penis; the whole organ, however, is represented by a ball-shaped mass which little resembles a penis until it is drawn downward. There is a good "apron" of prepuce below the glans.

Dr. Platt briefly described Thiersch's operation as the best one to be done in this case. This consists of four different operations done at intervals of several months, a preliminary division of the corpora cavernosa subcutaneously being in all cases necessary in order to lengthen the penis and bring it into proper position.

The patient can retain his urine at night, as a rule, while he suffers from incontinence in the daytime. Division of the corpora cavernosa subcutaneously was performed March 9, 1893, and the penis was kept bound down to accomplish the purpose described above.

Exhibition of Skin Cases.—Dr. LORD.

Multiple exostosis.—My first case is a young man, 24 years of age, who was quite healthy up to within two years ago. At that time he noticed several hard lumps appearing over his forehead and scalp, and a year ago they began to cause him a great deal of pain, which at times is so severe that he cannot attend to his work. We cannot obtain any history of specific trouble, but believing that to be the nature of the disease we placed him on potassium iodide, 15 grains three times a day. He has been taking it for two months without benefit. These lumps occur in groups; there are 18 over the forehead and about as many over the scalp, over the malar region and inside the mouth and on the jaw. They are hard, multiple exostoses or osteomata.

Alopecia areata.—The second case is one of universal alopecia areata. This man's trouble began about a year and a half ago. His hair gradually fell out, until now there is no hair on the body at all except a little in the axillæ. The rest of the body, even the arms, is entirely devoid of hair. We removed a section from the scalp in order to find out if possible something as to its histological structure and etiology, but this did not help us. There are two theories as to the causation of this disease; one, that it is a tropho-neurosis; another, that it is of a parasitic nature. The objections to the parasitic theory are that different observers describe different organisms, and they are unable to produce the disease by cultures upon animals.

Dr. OSLER.—Cases of multiple exostoses are, of course, not unknown, but such a case as this, occurring exclusively on the bones of the head and face, must be extremely rare. Multiple exostoses in the long bones are not very uncommon and, curiously enough, they may be hereditary. I remember seeing in Hamilton a gentleman in the advanced stages of tuberculosis. My attention was called to the fact that he had a number of exostoses on the bones of the arms and legs, and his wife said that her little boy had these tumors in very much the same positions; and her statement, upon examination, I found to be correct. Virchow has called attention to them and they are, of course, not unknown in the literature. I never remember to have read of a case in which the exostoses were confined entirely to the bones of the head and face.

Dr. LORD, replying to a question of Dr. Halsted, said that the iodide of potassium made the patient drowsy but did not relieve the pains.

Exhibition of Patient with Zonular Cataracts.—Dr. THEOBALD.

The case which I wish to show to the Society is rather more interesting because an iridectomy has been done on each eye which enables one to see very satisfactorily the nature of the cataract. As I presume all of you know, zonular cataract has this characteristic: if we represent a sectional view, the opacity occupies only the layers of the lens between the outer cortical layers and the nucleus. Exceptionally it is double in character, there being present two opaque zones, an outer one and a second one inside. This is a comparatively rare form. I have never met with, or at

least have never recognized, such a case, and I imagine that it is not very easy to recognize that there is a second zone of opacity inside of the first one. If the outer zone were comparatively less opaque than the inner one, we might more readily make out the presence of the latter. Viewed from the front the center of the lens looks opaque. As a rule the zone outside of the cataract is quite clear, although at times there can be seen in it radiating lines of opacity. This is the commonest variety of congenital cataract. One characteristic of this form of lens opacity is that it is, as a rule, non-progressive. The opacity forms usually during the latter months of fœtal life. Some disturbance in nutrition during the development of the eye causes the layers of opacity to form. Some authorities state, I do not know upon how good ground, that it sometimes develops after birth, in early infancy. But whether occurring in that way or as a pre-natal defect, it is, as a rule, stationary. Exceptionally, especially where there are spokes of opacity running out through the outer zone of the lens, the whole lens may eventually become opaque. When one looks at a zonular cataract with the pupil undilated it is very easy to mistake its true nature. One thing that would attract our attention, however, is the fact that the opacity is not so dense as we would expect it to be if all the layers of the lens were involved. The central portion, moreover, is rather less dense than the peripheral portion, and as this is the reverse of the rule in the ordinary forms of cataract, it should aid us in reaching a correct diagnosis. When, however, we wish to examine such a cataract so as to determine beyond question its true nature, the pupil should be dilated by means of a mydriatic. When that is done, we see at once that the opacity does not involve the whole of the lens, but is confined to the central portion, leaving a border of lens substance which is free from opacity. When we look into the dilated pupil with the ophthalmoscope we get the impression of blackness in the center, while in the periphery we obtain the usual red reflex from the fundus. By oblique illumination we see the transparent lens substance at the periphery of the pupil and a grayish appearance in the center. The vision in these cases is different from that in ordinary cataracts. As a rule it is not so bad. There being merely a zone of opaque material, the rays of light are not intercepted to the same degree that they are when the whole lens is involved in the opacity. The vision simulates myopia, as a rule, small objects being seen better when held very close to the eye, as they then form a larger retinal image. It happens in some instances, as in this patient, that the fixation is eccentric. In order to see an object best she did not, before the iridectomies were performed, look directly at it, but slightly away from it, fixing it with an eccentric portion of the retina. Zonular cataract occurs almost always in both eyes. I have not met with a case in which only one eye was involved. It is stated upon good authority that a tendency to zonular cataract is very often inherited —that cases occur in different generations of the same family.

As to the etiology of zonular cataract we are in a measure in the dark. We know, however, several things in regard to it. We know that it occurs very frequently in the subjects of infantile convulsions (Arlt). We know, too, as Horner has pointed out, that there is a connection between rachitis and zonular cataract. It also occurs in the subjects of inherited syphilis. Very often in connection with zonular cataract we find myopia of considerable degree present.

As to treatment: there are two ways in which it may be dealt with. In the first place, supposing that we are dealing with young subjects, we may needle the cataract and so bring about an opacification of the whole lens and ultimately its absorption. Or we may perform an iridectomy, so as to make an artificial pupil over the transparent portion of the lens which is ordinarily covered by the iris. There are advantages and disadvantages in each of these methods. In the first place, if we needle the lens, we perform an operation in which there is some risk. There being so much of the lens substance transparent, needling is a more serious matter than when it is resorted to in the ordinary soft cataracts of infancy or childhood. The aqueous humor gaining entrance through the torn capsule, the whole lens becomes rapidly opaque and swells up very much, and there is risk of pressure, causing iritis, accompanied, perhaps, with glaucomatous symptoms. This is an objection which does not hold good, at least not to the same extent, in the ordinary varieties of soft cataract. Furthermore, having succeeded in getting rid of the lens by this operation, we have then a young subject absolutely dependent upon glasses, and having no accommodative power in the eye. The individual is compelled henceforth to use glasses of one strength for distance and of a different strength for near vision.

The operation of iridectomy, while freer from risk, and not depriving the eye of its power of accommodation, has this objection, that the periphery of the lens and of the cornea are optically imperfect. When the rays of light can pass only through the periphery of the lens and cornea, the image which they form upon the retina is imperfect, and vision is by no means as good as it is when they can reach the retina through the central part of the dioptric media. One point which would determine which of the two operations described should be selected is the breadth of the transparent zone of lens substance. If it be quite narrow, or if there be many rays of opacity running through it, leading us to anticipate that the whole lens will, after a time, become opaque, we would be deterred from making an artificial pupil. If, however, the clear border of the lens is comparatively broad and is free from opacities, then one feels more disposed to resort to iridectomy. This was the case here, and I performed an iridectomy inwards on each eye. This is the direction generally chosen where one has the selection of the site, since the visual axis lies nearer to the nasal than to the temporal side of the cornea. If, however, the lens is clearer in some other direction one selects that direction. Dr. S. M. Burnett, of Washington, has recently pointed out, as the result of measurements with the optometer, that the corneal curve is more asymmetrical to the nasal than to the temporal side, and possibly this may influence us in the selection of the site of the artificial pupil.

The improvement in vision in this case is decided and yet not as great as one would anticipate. The operation was done on the right eye on March 21, 1892. I have not been able to find a record of the vision of that eye before operation. The vision now is only $\frac{5}{200}$, and with a glass it is improved to 20/cc. I have, however, a record of the vision of the left eye before operation. The vision on May 23, 1892, was 6/$\frac{1}{2}$ cc. It is now 20/cc., a decided change for the better. She has now with her two eyes 20/cc. vision without glasses, can read J. No. 2, and has central instead of eccentric fixation, as formerly. Before either eye was operated upon she used only the left eye and the right squinted outwards. After I did the iridectomy on the right eye the vision was improved so materially that this eye was used exclusively and the left eye diverged. After the operation on the left eye she preferred to use this eye again, and then the right eye once more diverged. This condition lasted for several months, but then she obtained binocular vision. She had, however, a considerable amount of hyperphoria, a tendency upward of the left eye of seven degrees, causing asthenopia, and to correct this I divided the inferior rectus muscle of the right eye and she has been much more comfortable since. She still has weakness of the internal recti and I think I shall eventually have to operate for this. She has also, as may be seen, a small anterior pyramidal cataract in each eye.

Demonstration of Specimen of Amœbic Abscess of Liver.—Dr. Thayer and Dr. Flexner.

Dr. Thayer first spoke of the clinical side of the case, as follows: The patient from whom the specimen came was admitted to the Hospital on the 9th of February of this year. He was an unmarried man, 51 years of age, a native of this country. When admitted he complained of chills, fever, and sweating. His family history was

negative. He had always been a perfectly healthy man excepting for an attack of ague at the age of ten. He had been a barkeeper for 15 years and a hard drinker. He had had gonorrhœa, and had syphilis fifteen years before entrance. The illness of which he then complained began about two months before entrance with an attack of nausea and vomiting. Six weeks before entrance he complained of chilly sensations and severe sweating every morning at about 3 o'clock. The night before entrance he had a very severe chill. His appetite was failing. He had lost 20 or 30 pounds in two months. On examination we found a large well-formed man, with slightly sallow complexion, but not of a cachectic appearance. The pulse was 84 and soft; vessel wall slightly thickened. The tongue was dry and brown. There was nothing remarkable about the thoracic organs.

The rest of the note was as follows: "Abdomen a little full, symmetrical; veins quite distinct; soft and painless on pressure. The edge of the liver is indistinctly felt about at the level of the umbilicus on the right side and in the middle line about 5 cm. above the umbilicus; it does not feel prominent and the edge is not at all distinct. The upper limit of absolute dullness in the mid-sternal line is at the base of the ensiform cartilage; in the para-sternal line, at the lower border of the 5th rib; in the mammillary line, on the 5th rib; in the mid-axilla, on the 6th rib; in the nipple line there is 19 cm. of liver flatness. Behind there is flatness at the upper margin of the eighth rib. There is distinct tenderness on deep pressure in the liver region and along the costal margin. There are no enlarged glands." The rectal examination was negative. *Urine* clear, pale, acid, 1012; faint trace of albumen; microscopically a few hyaline and granular casts were seen; no diazo reaction. The stools negative upon examination. Amœbæ were looked for but none were found. A rectal tube was also introduced, but no amœbæ were obtained. The blood was examined on the 11th, two days after entrance, with the following result: Red corpuscles, 3,088,000; colorless corpuscles, 22,500. On the 10th and 11th the patient had shaking chills followed by sweating, the temperature reaching 104.6° on the 10th and 103° on the 11th.

Thus we had a man who gave the history of chills and fever. He was pale, had a distinctly sallow look, and appeared like a man with some septic trouble. His only distinct physical sign was a very much enlarged, tender and soft liver. Two days after entrance he had two very severe chills in the afternoon, followed by sweating at night. The diagnosis lay between abscess of the liver and a possible neoplasm. Dr. Osler was inclined to think the case one of abscess of the liver and advised an exploratory incision, an opinion in which Dr. Halsted, who had also seen the case, concurred. In order not to interfere with the surgeons, no puncture was made with aspirating needles. The patient gave absolutely no history of having had diarrhœa or anything like an appendicitis, and it was only after the operation, on further inquiry, that he said he did remember having had during the previous summer a diarrhœa which lasted about four weeks off and on.

The patient was transferred to the surgical side on the 12th, and on the 13th Dr. Halsted operated, making an incision about 14 cm. long parallel to and about 3 cm. below the costal margin. The liver was found to be free from adhesions excepting a few far up under the diaphragm. The surface was smooth and the liver appeared to be symmetically enlarged. Aspirating needles were introduced in various directions with a negative result. The abdominal wound was then closed and the needle was introduced in several of the lower intercostal spaces. Finally on introducing the needle in the 6th space, in about the anterior axillary line, after passing through the diaphragm and about 5 cm. of liver substance, the needle passed into a cavity from which about 30 cc. of a brownish puriform fluid of an anchovy sauce appearance were removed by the aspirator. A second incision was then made parallel to the first and about 8 cm. above it, and portions of the 6th and 7th ribs were resected. From this opening the pleural cavity was shut off by packing with strips of sterilized gauze. The diaphragm was then incised and the peritoneal cavity shut off in the same way, leaving the surface of the liver exposed for an area of about 6×3.5 cm. The patient was then sent back to the ward to wait until adhesions had formed about the opening.

The thick puriform fluid I examined microscopically, and found in the fresh specimens no well-preserved cells of any sort—merely a granular debris. In three or four stained specimens not a single well-preserved cell was found; occasionally a more or less broken off liver cell was seen, but no leucocytes. No bacteria and no amœbæ were seen in these specimens.

On the 14th Dr. Halsted made an incision into the liver through the opening, and at a depth of about 5 cm. a large cavity was opened, from which 1000–1500 cc. of a fluid escaped similar to that which was obtained by the aspirating needle. A large drainage tube was introduced and the wound packed with iodoform gauze.

The patient did well until the 25th, eleven days after the operation, when he had a severe hemorrhage into the wound, from which he never recovered. He died on the 27th, thirteen days after operation.

The temperature after the operation ranged between 98.4° and 102°.

The contents of the abscess were similar to the fluid obtained on aspiration. No well-preserved cells were found, only an occasional degenerated liver cell. No bacteria were found in the cover-glasses, and cultures were negative, but after some search I found a certain number of quite actively motile amœbæ showing every characteristic of the amœba coli.

I think that the presence of a puriform fluid without actual pus cells or bacteria, such as was obtained on the first aspiration, might have justified us in strongly suspecting the presence of the amœba coli even though the amœbæ were not to be found themselves.

It is certainly very interesting that from a relatively slight diarrhœa, of which the patient made no particular note, an amœbic abscess of this sort should have arisen. No other point of origin suggests itself.

Dr. FLEXNER.—This case came to autopsy thirteen days after the operation. There was an incision obliquely along the edge of the ribs on the right side which communicated with the interior. There was a funnel-shaped opening in the outermost part of it which contained gauze. This opening led directly into a cavity in the liver. On account of the fact that an incomplete autopsy was made, the same care which could have been exercised had a complete autopsy been permitted was not possible, so that the relations were worked out after the viscera were removed from the body. This cavity in the liver which communicated with the outside was discovered, after removal of the liver, to be in the right lobe and but a short distance beneath the diaphragm. There were very firm adhesions between this cavity in the liver and the abdominal wall. The cavity reached through the entire breadth of the liver, penetrated through the liver, and on the posterior surface was an abscess cavity having for its boundaries the diaphragm above, the right kidney and suprarenal capsule below, and the abdominal walls to one side and behind. This cavity contained a considerable amount of pus and some necrotic material. The whole of this abscess was almost as large as an orange. The smallest portion of it was the external portion which was in communication with the outside of the body. The contents of the abscess consisted of pus, necrotic material and blood. There was a history of a severe hæmorrhage two or three days before the death of the patient. This hæmorrhage was traced to a perforation in the inferior vena cava. I have here a portion of the vena cava which was removed with the liver. In the cava are two openings which can readily be seen by holding it up to the light. A portion of the wall of the abscess is made up of the adventitial coat of the vena cava. The contents of the abscess were examined and amœbæ, alive and moving, were found in them. In addition to this abscess there were twelve or more abscesses limited

to the right lobe of the liver. In addition there were small areas of simple necrosis of tissue. None of these small abscesses contained amœbæ, but streptococci in pure cultures were found. In the larger abscess there was found a mixture of bacteria. There were metastatic abscesses in the lung in connection with the pulmonary artery, which were clearly due to infectious emboli which had entered the vena cava and then passed through the right side of the heart to the lungs. There was a considerable clot of blood, as large as a pigeon's egg, in the gall-bladder. Just how it got there we do not know. Although no ulcerations were discovered in the intestine, yet there were evidences of ulceration that had entirely healed. There were several cicatrices in the large intestine and one distinct cicatrix above the valve. I think that this variety of fluid from an hepatic abscess is very suggestive of its amœbic origin. I think that one of the points that Dr. Councilman made out in reference to pure amœbic abscesses was that there was more necrosis than actual pus formation.

Bromide of Strontium in the Treatment of Epilepsy.—Dr. BERKLEY. [See page 52.]

Dr. HURD.—Does this drug produce any disorder of the stomach, any burning?

Dr. BERKLEY.—It is rather a pungent salt, but I have had no complaints from it upon that score.

Dr. HURD.—I suppose we have all had a similar experience in the treatment of epilepsy. Patients almost always improve for a time under any new remedy, but the number of seizures usually increases again after a time and the condition of the patient is not permanently improved. The tables which Dr. Berkley has prepared show that temporarily at least the bromide of strontium has been followed by good effects.

The Pfeiffer-Bacillus—the Causative Agent in Influenza.—Dr. JULIUS FRIEDENWALD. (Read by Dr. Hurd.)

Since the epidemic of influenza of 1889–1890 in Europe, many attempts have been made by bacteriologists to discover the causative agent of this disease. In the early months of 1890 the announcement was made by Dr. Julles (Vienna), claiming the discovery of an organism which was similar to the Fränkel's pneumococcus and which he considered to bear a causal relation to this disease. Klebs[1] discovered organisms in the red blood corpuscles of patients suffering from influenza; Seiffert,[2] peculiar cocci in the sputa of patients, and M. Kirchner,[3] a diplococcus, probably identical with Seiffert's, which he was able to produce in pure cultures. None of the above organisms can now be looked upon as bearing any causal relation to influenza. There yet remains the organism of Pfeiffer,[4] which, having fulfilled the crucial test of the three postulates of Koch, may now be considered as the causative agent of this disease. From the sputum of patients, cover-slip preparations can be made, according to Pfeiffer, by staining the specimens in Löffler's methylene blue or in a weak watery solution of carbol-fuchsin. In every specimen numerous influenza bacilli are to be found. These organisms are not quite as large as the bacilli of mouse-septicæmia; they are two or three times longer than broad; sometimes larger specimens are found, especially in pure cultures. After much difficulty and many failures in the production of cultures—for these organisms could not be grown on the ordinary cultivating media—Pfeiffer discovered that blood is necessary for the growth of the bacilli. Sterile blood was dropped on the surface of slanting agar tubes and a drop of influenza sputum mixed with the blood. The organisms grew luxuriantly. In this way pure cultures have been obtained in abundance. Pfeiffer determined afterwards that the hæmoglobin of the red blood corpuscles is the substance which is necessary for their growth.

The growth of the influenza bacillus on blood agar is very characteristic. Cultures of twenty-four hours' growth show very small colonies of light, transparent drops, which have a tendency to flow together only when many colonies lie in immediate contact. The influenza bacillus is aerobic, growing only in the presence of oxygen, and best at a temperature of 38° C.; at 43° C. its growth ceases, and at a temperature of 28° C. it grows badly. In drinking water the organisms die rapidly. They are also very susceptible to the process of drying, which destroys them quickly. In the sputum of none but influenza patients could this organism be discovered. The bacilli were also found in all cases in the lungs of patients dying from this disease. Inasmuch as animals, as a rule, are immune to influenza, another difficulty arose in fulfilling the condition of inoculation. Mice, rats, guinea-pigs, rabbits, pigs, cats, and dogs were experimented on in turn, but none of these animals were found by Pfeiffer to be susceptible to this disease. To monkeys only could he transmit the disease. Injections of cultures into the lungs, through the chest wall, as well as inoculations upon the mucous membrane of the nose of these animals, produced attacks of the influenza. From these experiments of Pfeiffer the causal relation of the influenza bacillus to the disease must be admitted, the three postulates of Koch having been fulfilled:

1. The influenza bacillus is to be found in all cases of influenza.
2. The organism cannot be found except in this disease.
3. With pure cultures the disease can be produced in susceptible animals (monkeys).

In conclusion it is interesting to note that Pfeiffer has isolated a form of pseudo-influenza bacillus which he has found in three cases in the broncho-pneumonia of diphtheritic children, and which, like the influenza bacillus, grows in cultures upon blood agar. A differential diagnosis is easily made through the difference in growth of the two organisms.

[1] Klebs: Centralblatt für Bacteriologie und Parasitenkunde, 1890, Bd. VII, No. 5.

[2] Seiffert: Volkmann's Sammlung Klinischer Vorträge, No. 240.

[3] Kirchner: Zeitschrift für Hygiene und Infectionskrankheiten, Bd. IX, S. 329.

[4] Pfeiffer: Die Aetiologie der Influenza, Zeitschrift für Hygiene und Infectionskrankheiten, Bd. XIII, S. 357, 1893.

NOTES ON NEW BOOKS.

A Handbook of Invalid Cooking for the use of Nurses in Training Schools, Nurses in Private Practice, and others who care for the Sick. By MARY A. BOLAND, Instructor in Cooking in the Johns Hopkins Hospital Training School for Nurses. (*New York: The Century Co.*, 1893.)

This neatly printed, attractive little book of 300 pages is more a text-book for the class-room instruction of nurses than a handbook of cooking, and hence it cannot be judged according to the usual cook-book standard. The scientific portion, which would be of little value in a cook-book proper, is here of service as a manual to be studied by those who desire to learn something of the chemical processes which are called into activity by cooking. Some of the scientific definitions are not beyond criticism, and some of the subjects treated in the Explanatory Lessons seem out of place in a cook-book. As a single example of the latter a brief chapter on ventilation may be mentioned. The directions for the preparation of dishes are clear and satisfactory. The chapter on the serving of food is somewhat fanciful, and impresses the reader as not altogether practical. The chapter on the feeding of infants and sterilization of milk is excellent. Taken as a whole the book is worthy of great praise, and will serve a useful purpose to those who wish to prepare food for sick persons.